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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,334	07/22/2003	Diane R. Meirowitz	P9240	7763

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EXAMINER
TECKLU, ISAAC TUKU ·

ART UNIT	PAPER NUMBER
2192	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	Applicant(s)	
Office Action Summary	10/625,334	MEIROWITZ, DIANE R.	
	Examiner	Art Unit	
	Isaac T. Tecklu	2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>*22 July 2003*</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>*09/22/03*</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

DETAILED ACTION

1.   This action is responsive to the application filed on 07/22/2003.

2.   Claims 1-39 have been examined.

Oath/Declaration

3.   The office acknowledges receipt of a properly signed oath/declaration filed on
07/22/2003.

Claim Objections

4.   Claims 1, 9, 25, 33 and 38 are objected to because of the following informalities: claims

1, 9, 25, 33 and 38 recite "... has as input parameter ..." (in lines 2, 1, 1, 4 respectively) instead

of -- has an input parameter --. Appropriate correction is required.

Claim Rejections - 35 USC § 101

5.   35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or
composite of matter, or any new and useful improvement thereof, may obtain a patent
therefor, subject to the conditions and requirements of this title.

6.   Claims 14-37 are rejected under 35 U.S.C. 101 because the claimed invention is directed
to non-statutory subject matter.

    Claims 14, 18, 25 and 30 are non-statutory as being "An apparatus" without being
supported by hardware such as tangible computer storage or execution engine, which would
enable one skill in the art to construe that the apparatus is built from tangible product to carry out
any functionality being conveyed from the claim. Thus, the apparatus is computer listings *per se*,
i.e., the descriptions or expressions of the programs, are not physical "things." They are neither
computer components nor statutory processes, as they are not "acts" being performed. Such

claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. In contrast, a claimed computer- readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035. Accordingly, it is important to distinguish claims that define descriptive material per se from claims that define statutory inventions.

Claims 15-17, 19-24, 26-29 and 31-37 are rejected for failing to cure the deficiencies of the above rejected non-statutory claims 14, 18, 25 and 30 above.

See MPEP 2106.01(I)

Claim Rejections - 35 USC § 102

7.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8.   Claims 1-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Burke et al. (US 5,448,737), hereinafter Burke.

As per claim 1, Burke discloses a method for generating factored assert chains from assert statements in a program using a compiler (e.g. Fig. 9a-d and related text), the program having a dominator tree, wherein the method has as input parameter X initially assigned an entry node of said dominator tree (e.g. Fig. 11b and related text), the method comprising:

for each statement S in x (e.g. Fig. 10a, element 1020 and related text):

finding each variable use in the statement (col. 5:35-40 "... each variable ...

represent whatever value the variable may have ..." and col. 8: 3-10 "... any use of V ..." and

e.g. Fig. 10a, element 1022 and related text);

for each variable use in the statement (col. 5:35-40 "... each variable ... represent

whatever value the variable may have ..."):

determining if there is an available assert statement which defines

information about the corresponding variable for the variable use (col. 2: 9-15 "...

information about the variable x ...");

making an assert chain from the variable use to the available assert

statement if there is an available assert statement which defines information about the

corresponding variable for the variable use (col. 10: 15-25 "... data flow chains is achieved by

constructing a data structure which includes an AllDef table and an All Use table ..."); and

iteratively calling the method using each child of X in the dominator tree as a

parameter (col. 14:62-68 "... for every child Y of X .. a recursive procedure call ...".and col. 13:

5-35 TABLE 5 and related text).

As per claim 2, Burke discloses the method of claim 1, further comprising saving a

current value in a map of assert statements for each variable (col. 17: 55-65 "... each definition

side d that defines variable v has an entry in AllDef table ..." and col. 8: 35-40 "... new variables

Vi are generated ..." and e.g. Fig. 9d, and related text).

As per claim 3, Burke discloses the method of claim 1, further comprising:

determining if the statement is an assert statement after said making (col. 2: 9-15 "...

information about the variable x ...");

adding a mapping from each Variable use in the statement to an assert statement if

the statement is an assert statement (col. 8:30-35 "... phi(V,V) are inserted ..."); and

deleting a mapping of any reference to an assert statement for each definition in the

statement if the statement is not an assert statement (col. 17: 30-35 "... delete an entry

...").

As per claim 4, Burke discloses the method of claim 1, further comprising restoring a

current value of a map of assert statements for each variable after said iteratively calling (e.g.

Fig. 10a, element 1022 and related text).

As per claim 5, Burke discloses the method of claim 1, wherein an assert Statement is a

statement identifying known information regarding a variable (col. 5:35-40 "... each variable ...

represent whatever value the variable may have ..." and col. 8: 3-10 "... any use of V ..." and

e.g. Fig. 10a, element 1022 and related text).

As per claim 6, Burke discloses amethod for generating factored assert chains for a

program in a compiler, the method comprising:

generating one or more assert statements in a basic block of the program (col. 10: 15-25

"... data flow chains is achieved by constructing a data structure which includes an AllDef table

and an All Use table ...");

creating a dominator tree for said basic block (e.g. Fig. 11b and related text);

creating an initialized map of assert statements for each variable in said basic block (col.

17: 55-65 "... each definition side d that defines variable v has an entry in AllDef table ..." and

col. 8: 35-40 "... new variables Vi are generated ..." and e.g. Fig. 9d, and related text); and

calling an assert chain search procedure with entry as a parameter, wherein entry is a

root node of said dominator tree (e.g. Fig. 9a, element 915 and related text).

As per claim 7, Burke discloses the method of claim 6, wherein said generating includes:

finding an if...then...else statement in said basic block, said if...then...else statement

having a condition, a then portion, and an else portion (e.g. TABLE 8 and related text);

inserting an assert statement indicating that said condition is true in said then portion

(e.g. TABLE 8, lines 50-65 and related text); and

inserting an assert statement indicating that said condition is false in said else portion

(e.g. TABLE 8, lines 50-65 and related text).

As per claim 8, Burke discloses the method of claim 6, wherein said generating includes:

finding a do loop, said do loop having a non-constant stride (e.g. TABLE 2 and related

text); and

inserting an assert statement indicating that said stride is not equal to zero (col. 12:29-35

"... Rdef is either 0 ...").

As per claim 9, this is the another method version of the claimed method discussed above (Claim 1), wherein all claim limitations have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 10, this is the another method version of the claimed method discussed above (Claim 2), wherein all claim limitations have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 11, this is the another method version of the claimed method discussed above (Claim 3), wherein all claim limitations have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 12, this is the another method version of the claimed method discussed above (Claim 4), wherein all claim limitations have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 13, this is the another method version of the claimed method discussed above (Claim 5), wherein all claim limitations have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 14, Burke discloses an apparatus for generating factored assert chains from assert statements (e.g. Fig. 8 and related text), the apparatus comprising:

a statement traverser (e.g. TABLE 1 and related text);

a variable use finder coupled to said statement traverser (e.g. Fig. 8, 840 and e.g. Fig. 9a, element 915 and related text);

a variable use traverser coupled to said statement traverser and said variable use finder (e.g. Fig. 8 and related text);

an available assert statement determiner coupled to said variable user traverser (e.g. Fig. 8 and related text);

an assert chain creator coupled to said available assert statement determiner and to said variable use traverser; and

an assert chain search procedure iterative caller coupled to said statement traverser (e.g. Fig. 8, element 845 and related text).

As per claim 15, Burke discloses the apparatus of claim 14, further comprising a current variable value map of assert statements saver coupled to said statement traverser (col. 17: 55-65 "... each definition side d that defines variable v has an entry in AllDef table ..." and col. 8: 35-40 "... new variables Vi are generated ..." and e.g. Fig. 9d, and related text).

As per claim 16, Burke discloses the apparatus of claim 14, further comprising:

an assert statement determiner coupled to said statement traverser and to said assert chain creator (e.g. Fig. 8, element 850 and related text);

a variable use mapping adder coupled to said assert statement determiner (e.g. Fig. 8, element 847 and related text); and

an assert statement reference mapping deleter coupled to said assert statement determiner (e.g. Fig. 8, element 850 and related text).

As per claim 17, Burke discloses the apparatus of claim 14, further comprising a current

variable value map of assert statements restorer coupled to said statement traverser.

As per claim 18, Burke discloses an apparatus for generating factored assert chains for a

program in a compiler (e.g. Fig. 8, 805 and related text), the apparatus comprising:

an assert statement generator (e.g. Fig. 8, 845 and related text);

a dominator tree creator coupled to said assert statement generator (e.g. 8, 835 and

related text);

an initialized map of assert statements creator coupled to said assert statement generator

(e.g. Fig. 8, element 847 and related text); and

an assert chain search procedure caller coupled to said initialized map of assert

statements creator and to said dominator tree creator (e.g. Fig. 8, element 848 and related text).

As per claim 19, Burke discloses the apparatus of claim 18, wherein said assert statement

generator includes: an if...then...else statement finder; and an assert statement inserter coupled to

said if...then...else statement finder (e.g. TABLE 8 and related text).

As per claim 20, Burke discloses the apparatus of claim 18, wherein said assert statement

generator includes:

a do loop finder (e.g. TABLE 2 and related text); and

an assert statement inserter coupled to said do loop finder (e.g. TABLE 2 and related

text).

As per claim 21, this is the another apparatus search procedure caller version of the claimed apparatus discussed above (Claim 14), wherein all claim limitations have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 22, this is the another apparatus search procedure caller version of the claimed apparatus discussed above (Claim 15), wherein all claim limitations have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 23, this is the another apparatus search procedure caller version of the claimed apparatus discussed above (Claim 16), wherein all claim limitations have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 24, this is the another apparatus search procedure caller version of the claimed apparatus discussed above (Claim 17), wherein all claim limitations have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 25, this is the another apparatus version of the claimed method discussed

above (Claim 1), wherein all claim limitations have been addressed and/or covered in cited areas

as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 26, this is the another apparatus version of the claimed method discussed

above (Claim 2), wherein all claim limitations have been addressed and/or covered in cited areas

as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 27, this is the another apparatus version of the claimed method discussed

above (Claim 3), wherein all claim limitations have been addressed and/or covered in cited areas

as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 28, this is the another apparatus version of the claimed method discussed

above (Claim 4), wherein all claim limitations have been addressed and/or covered in cited areas

as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 29, this is the another apparatus version of the claimed method discussed

above (Claim 5), wherein all claim limitations have been addressed and/or covered in cited areas

as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 30, this is the another apparatus version of the claimed method discussed

above (Claim 6), wherein all claim limitations have been addressed and/or covered in cited areas

as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 31, this is the another apparatus version of the claimed method discussed

above (Claim 7), wherein all claim limitations have been addressed and/or covered in cited areas

as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 32, this is the another apparatus version of the claimed method discussed

above (Claim 8), wherein all claim limitations have been addressed and/or covered in cited areas

as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 33, this is the another apparatus version of the claimed method discussed

above (Claim 1), wherein all claim limitations have been addressed and/or covered in cited areas

as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 34, this is the another apparatus version of the claimed method discussed

above (Claim 2), wherein all claim limitations have been addressed and/or covered in cited areas

as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 35, this is the another apparatus version of the claimed method discussed

above (Claim 3), wherein all claim limitations have been addressed and/or covered in cited areas

as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 36, this is the another apparatus version of the claimed method discussed above (Claim 4), wherein all claim limitations have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 37, this is the another apparatus version of the claimed method discussed above (Claim 5), wherein all claim limitations have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 38, this is the program storage device apparatus version of the claimed method discussed above (Claim 1), wherein all claim limitations have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

As per claim 39, this is the program storage device apparatus version of the claimed method discussed above (Claim 6), wherein all claim limitations have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Burke.

Conclusion

9.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isaac T. Tecklu whose telephone number is (571) 272-7957. The examiner can normally be reached on M-TH 9:300A - 8:00P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

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like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Isaac Tecklu
Art Unit 2192   TUAN DAM
                            SUPERVISORY PATENT EXAMINER